CLOSURE PLAN

FOR

GRANVILLE SOLVENTS, INC.

BRIEF HISTORY AND BACKGROUND. Granville Solvents, Inc., an Interim Status storage facility located in Granville, Ohio, submitted a Part "B" application for a permanent permit to continue operations as a Transfer Facility. In an action dated July 17, 1987 the application was denied. Granville Solvents, Inc. (GSI) has completed a partial closure which was requested in the past to minimize any perceived threat to human health and the environment. This Closure Plan addresses the remaining wastes at the GSI site.
Of the original nine (9) underground tanks listed in the original Part "A", four (4) have been removed. The solvent distillation equipment and piping for its supply and distillate lines have been removed. Earth has been excavated to uncover the tanks which have been removed and remains piled next to the immediate area from which it was removed. During the excavation of the tanks, one very limited area of contamination from a cracked ell in the piping to Tank 3 was detected. All earth which was obviously contaminated was removed and placed in drums for further disposal. At this writing, the plant has been dormant for approximately two and one half years due to a Temporary Restraining Order issued by the Licking County (Ohio) Common Pleas Court based on an inability to purchase requisite Environmental Impairment Liability insurance. Weekly site inspections have been carried out to observe the condition of drums stored and measure the levels of liquids in the tanks.

TANKS CONTAINING HAZARDOUS WASTES. Tanks 1 through 4 in the accompanying diagrams remain in the ground. Tank 1 contains sludge from Methylene Chloride recycling and residual water from plant operations during the recycling process. Tank 4 contains rain water run on and residual chloride wastes from storage of water from recycling operations. Tank 3 also contains rain run on. Volumes and types of these containers are 5,000 gallon carbon steel tanks which meet ASTM standards for underground tanks. The tanks are approximately 30 years old. None of the tanks have given any evidence of leakage. The volumes for these 5,000 gallon tanks is as follows:

Composite totals

Chlorinated - 6,000 gallons (tank 1 and 4)

Flammable - 6,400 gallons (tanks 2, 3, and 12)

Chlorinated wastes found in Tank 1 are the residue from Methylene Chloride recycling and from transfer of water and chlorinated sludge from Tank 4 and Tank 13. The bottom of Tank 1 contains an estimated 1500 gallons of non-pumpable solids. The balance is primarily water and some dispersed chlorinated solvents including Methylene Chloride, Trichloroethylene, and 1,1,1 Trichloroethane.

Tanks 2, 3, and 4 contain mostly water with trace amounts of flammable solvents. Tank 2 is empty of liquids with the exception of a pool of liquids remaining in a layer of non-pumpable solids. Tank 3 contains approximately 4500 gallons of water with a residual flammable solvent content. The bottom of Tank 3 contains a layer of non-pumpable solids. Tank 4 contains under 1000 gallons of water with a very low residual solvent content.

CONTAINER WASTE ON SITE. Granville Solvents, Inc. has on site at the time of closure approximately 315 drums of wastes. Of this

number, approximately 63 drums contain water wastes from emptying Tank 4 and from processes which separated water from other waste streams. Ten (10) drums contain contaminated earth removed from on top of Tank 2. This earth was the contaminated soil excavated from a small split in an ell which was in the supply line described above. Of the remaining 242 drums most contain solids which are the result of consolidation of wastes from drum heels left after liquid wastes had been decanted or pumped off.

Fifty-nine (59) drums contain chlorinated materials. The remaining 183 drums contain paint solids. Most of these drums are non-pumpable solids either with an absorbent added or untreated for land disposal. Depending upon the treatment services available to stabilize these wastes, and the prevaling land disposal restrictions, many would qualify for land disposal. A number of drums, however, will require incineration because of the low flash point and metal ions. This Closure Plan will plan for some bulk transportation of wastes, but that will be restricted to contaminated earth only.

TANK CLOSURE. Underground tanks can be cleaned in several ways, one being in situ by recirculating recyclable solvents to dissolve any settled solids and pumping both liquids and solids out with a vacuum tanker. Another is to "vacuum" the solids out of the tanks prior to solvent or power washing them. The cleanliness of all the tanks will be determined preliminarily by visible evidence of any waste remaining. If an unacceptable amount of solids remain after excavation and visual inspection through manheads or large fill openings, the above process of recirculating and/or vacuum pumping can be repeated until such time as those solids are removed. The solids will then be shipped to a disposal or recycle site for proper handling, or the spent solvent from the cleaning process will be shipped to an authorized Storage Facility/Recycler for recycling.

TANK CONTENT ANALYSES. Enclosed in this Plan, below, is an analysis of the contents of each tank. Copies of Gas Chromatographic traces of recent analyses of tanks 4, 3, 2, 1 and 12 are included as Figures 5 through 9. Tank 1 contains a semi-solid Methylene Chloride/Polyester resin material with the approximate content as noted. Tank 2 contains solids and residual liquid from flammable wastes blended for fuel specifications. Tank 3 contains the same waste stream plus water which ran on during a torrential downpour in summer 1986 when the head had been removed for pumping out the final waste liquids. Tank 4 contains water from the same source. Tank 12 contains mixed flammable wastes including ethyl alcohol, acetone, toluene, and xylene. All other tanks have been emptied, excavated, and removed as part of previous closure activity. Only tanks which have been certified as clean by an independent professional engineer will be released for sale or salvage to the general business public.

At the point at which the remaining buried tanks have been emptied as much as is practicable (see above), they will be completely excavated and removed. See the excavation plan below for handling of potentially contaminated soil from this excavation. Inspection of the emptied tanks will be done through the manheads of Tanks 1 through 4 and through the large 4" opening in Tank 12.

Tanks 1 through 4 are located below Tank 12 which is nested between Tanks 2 and 3. Complete inspection of the tanks will be done by properly outfitted personnel with breathing air supplied protective suits. Safety lines and harnesses will be used for any emergency extraction of those inspection personnel.

DISMANTLING OF PIPING AND DISTILLATION EQUIPMENT. Following waste removal, all piping remaining in the ground will be dismantled and removed for disposal as a solid waste. Distillation equipment has been disconnected, dismantled, cleaned and removed to storage.

EXCAVATION SCHEDULE. Excavation activities for cleanup of the areas to be closed will proceed according to the following plan. Prior to any excavation, a Statistical Mean Level of Contamination will be determined using procedures described in SW-846. Excavation will then proceed.

TOP TANK. When Tank 12 has been emptied, any remaining earth from around it will be piled in Area A (Figure 1) as appropriate. Upon the receipt of the composite analysis of the earth extracted using a split spoon sample gatherer, the earth will either be removed for disposal or set aside for backfill if no contamination is found above statutory limits.

DEEP TANKS. Then the deep tanks (1 through 4) will be inspected for cleanliness to the satisfaction of the Professional Engineer. If satisfactory, the tanks will be removed for the same disposition as the smaller tanks. Samples will be taken as described below and any further excavation will be made until such time as the cleanliness criterion is achieved. The excavated earth will be disposed of or set aside for back fill using the same criteria as for Tank 12.

EXCAVATION OF AREA "A". At this point, all excavated earth will either have been set aside as non-hazardous or removed for disposal. The top 4" of soil in Area A will be self-declared as hazardous and removed for disposal as will 6" of half the surface in Area E, the Still Building. Following these actions, sampling of the next 4" layer will proceed as proposed below.

SOIL SAMPLING PROGRAM. Sampling of the site will be performed in accordance with Test Methods for Evaluating Solid Wastes (SW-846). Areas A, C, D, E, and F which correspond roughly to West Exterior Drum Storage Pad, North Drum Storage Area, East Storage Area, Still Building, and West Drum Pad Runoff Area, will be divided into 2' X 2' grids. Each grid square will be numbered consecutively within its area (Figure 2).

STATISTICAL PRELIMINARIES. A preliminary determination of Mean contamination level will be necessary prior to any excavation of areas A, C, D, E, or F. A series of Soil Gas Analysis (cf. discussion below) samples will be drawn using random numbers for the area. The results of the analyses from the Soil Gas Analyses will give a two dimensional graphic representation of areas of contamination and levels, and will identify areas of contamination which would be profitable for initial excavation.

1. 10 random samples (Figure 4) will be drawn in the grids to the west of the main building where the most activity took

place.

2. Since substantially less storage activity took place in the other areas, only 3 (Figure 4) will be drawn in each of them.

3. From the aresults of the analyses done on-site, data will be graphically represented to indicate areas of contamination. Samples will be drawn within the area to determine a sample mean, and variance and then the number of samples to be collected.

SAMPLING PROCEDURES. Sampling and analytical procedures will follow these steps:

1. Samples will be drawn with an auger bore to 4 inches.
2. A sample log will be maintained with every sample entered by date, time, location, etc. as required by good sample accountability procedures found in SW-846.

3. Gas samples extracted by Soil Gas extraction will be accounted for in the same way as solid samples taken.

EXCAVATION CRITERIA. When the analytical results have been completed and a clear understanding of the state of the earth beneath the tanks and in the soil areas around the site is known, excavation of soil will proceed using the following criteria.

1. Criterion for the decision to excavate will be based upon a trigger level of 1 PPM of any listed chemical waste found during the analyses.

2. Soil above the tanks in Area B has been excavated and piled. Four samples from this pile will be drawn and analysed as above. If no contamination is found, this soil will be used to backfill the hole left from removal of the tanks.

3. Three points will be sampled for analyses at a depth of 6" beneath Tank 4 using the same procedures and criteria as above. Further sampling of newly exposed soil will be conducted as above. Excavation will continue in 6" layers as necessary to remove any further contamination found.

CLOSURE OF STORAGE BUILDING. The Storage Building is floored with wire reinforced concrete slabs. The joints between the slabs have been sealed with an epoxy resin which is used to seal such cracks, however some contamination may exist beneath the slabs. In order to test for any contamination, Soil Gas samples will be drawn through holes drilled along the seams every 4 feet. Results of the analyses of these samples will indicate where subsoil contamination will be found.

Air jackhammers will be used to breakup and remove the concrete covering any contamination discovered. Further samples using soil gas sampling at the intersection of 2' X 2' grid superimposed over the exposed surface will describe the exact limits of contamination. Soil samples drawn with an auger bore will give an exact three dimensional description of the contaminants and the depth of contamination.

Excavation will proceed in accordance with the procedures used in removing the tanks until no measurable indication of contamination remains. Contaminated soil will be disposed of by containerizing the soil in drums marked according to the location and contamination present. Final disposal of the drum will depend upon the type of contamination and land disposal restrictions in effect at the time.

PRELIMINARY TESTING BY SOIL GAS ANALYSIS. On site testing for indications of contamination can be accomplished in "real time" using Soil Gas Analysis techniques. Typical field sampling equipment includes battery operated Gas Chromatographs which will indicate the presence of any contamination at the sample gathering site. While this technique is not adequate for final indications of soil contamination, it does indicate an area which needs more specific analyses by traditional sampling procedures.

Sampling is done by driving a four (4) foot deep hole and inserting a hollow probe connected to a manual evacuation pump. The probe is purged after every sample to eliminate carryover contamination. With the probe in place, earth is filled back around the probe to seal the hole from ambient air. One sample is drawn and expelled to purge the system. A second sample is extracted and then pumped into the sample collection container for archive. In-field gas chromatography eliminates the sample collection because the gases are immediately injected into the Gas Chromatograph for analysis. Another technique which may be appropriate allows for a split spoon soil sample which is then thermally desorbed into a Gas Chromatograph. For preliminary indications of contamination the direct injection of gases will give the appropriate response to evaluate the need for further testing.

CLOSURE SCHEDULE. Proposed schedule for Closure is dependent upon the availability of funds to pay for the services. Using the date of availability as the start date, the following schedule is proposed.

1. Pump all liquids from the underground storage tanks and remove the liquid to appropriate Treatment/Disposal sites.

2. Remove all drums containing wastes from the Storage Building shipping drums of liquids first, followed by drums of solids and stacked empty drums along the north side of the building.

3. Clean out the solids in the bottoms of tanks containing solid wastes.

4. Excavate tanks remaining in the ground and remove them to a point inside the fenced property, or immediately outside the facility which can be temporarily fenced in where they can be finally cleaned.

5. Evaluation of soil condition in the tank excavations. Further excavations as necessary until the excavated tank areas are certified for backfilling.

6. Excavated soil from tank excavations returned to the excavations or removed for disposal allowing for more freedom of movement inside the active area.

7. At the same time as this excavation/evaluation/removal process is being done on the west side of the Storage Building, sampling, testing and excavation of other areas east and north of the building can be accomplished without interfering with the excavation on the west end.

8. Sampling and removal of the flooring in the Storage Building will be done after all external activities have been completed. Contaminated soil from under the concrete floor and from in front of the loading dock area can be removed as bulk waste until such time as the soil area is certified to meet EPA clean soil standards.

9. With the use of portable analytical equipment, the certification of soils, excavation, and removal of soil, removal of all tanks and drums could be done within ninety (90) days from the start of operations.

CLOSURE COST ESTIMATES. With the upward spiral in waste disposal costs, the following estimates of closure costs are the equivalent of hitting a moving target with a B-B gun.

Cost estimates are based upon a range of services available depending upon the approval of the cited technology and disposal sites. Costs will be given for "Least Expensive", "Probable Cost", and "Most Expensive". Technology for each estimate will be noted.

WASTE	TECHNOLOGY	LEAST	PROBABLE	MOST
Bulk Water -	Ion Exchange	.10/gal	.15/gal	.20/gal
	Absorption	.10/gal	.15/gal	.20/gal
	Incineration	.25/gal	1.00/gal	
Bulk Solids -	Resuspension	.80/gal	1.00/gal	
	Fixation	N/A		
	Incineration	6.35/gal	7.65/gal	10.00/gal
Drums: Organics	Recycle	1.75/gal	2.00/gal	2.50/gal
	Incinerate	6.35/gal	7.65/gal	10.00/gal
Water	Ion Exchange	.20/gal	.25/gal	.30/gal
	Absorption	.20/gal	.25/gal	.30/gal
	Incineration	.35/gal	1.50/gal	

Using volumes and counts listed above, the following is an estimate of the disposal costs for non-soil wastes exclusive of freight:

WASTE	LEAST	PROBABLE	MOST
Bulk Water:			
Tank 1	$450	$675	$4500
Tank 3	$450	$675	$4500
Tank 4	$100	$150	$1000
Bulk Solids:			
Tank 1	$1200	$11475	
Tank 2	$1200	$11475	
Tank 3	$1200	$11475	

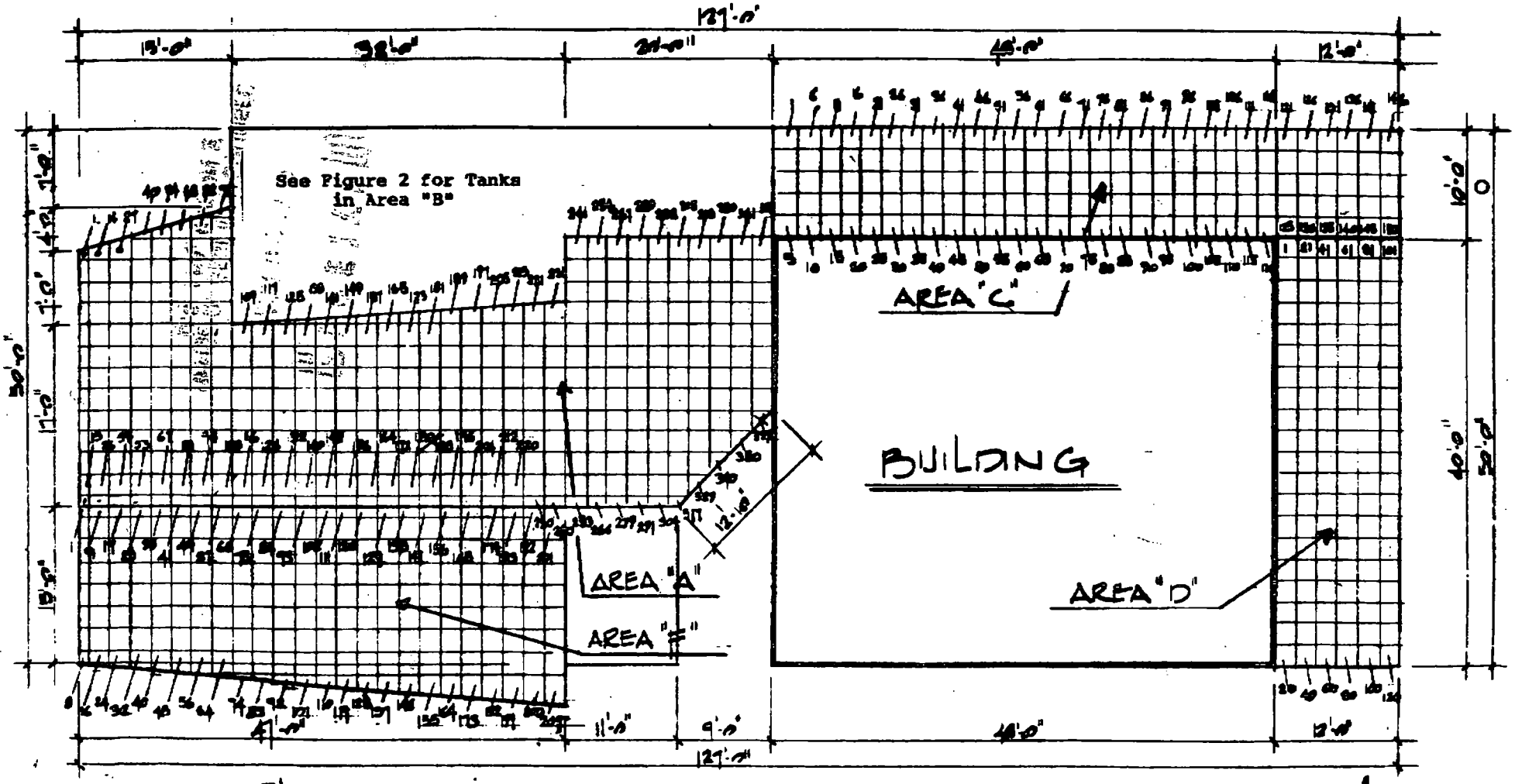
Tank 12	$ 800	$ 7650	
Drums: Organics			
	$33275	$101640	
Water	$ 700	$5200	
Estimated Cost:			
	$39375	$15041	$158915

Disposal costs for contaminated earth, drummed earth, freight, analytical costs, engineering fees, profile charges and other miscellaneous costs cannot be estimated due to the complexity of applicable land bans, taxation schedules, and other unforeseeable expenses. Using a multiplier of 50% added to the estimates, the total could be as high as $59000 for "Least", $225,622 for "Probable" and $238,373 for the "Most".

CERTIFICATION

I hereby certify under penalty of law that I have personally prepared this Closure Plan using information available to me. I believe the information upon which the Closure Plan is based to be true, accurate, and complete to the best of my knowledge. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Date: 28 Feb 89 Signature:



SITE PLAN